



NEW YORK STATE

Parasitology Proficiency Testing Program

Parasitology (General)

06 October 2009

The purpose of the New York State Proficiency Testing Program in the category of Parasitology (General) is to monitor the performance of applicant laboratories in detecting and identifying parasites in fecal emulsions, fecal smears, and blood films. This document reports the results for the October 2009 proficiency test in Parasitology (General).

Sample Preparation and Quality Control

All emulsions and slides used in this test were prepared by a commercial source. The emulsions were dispensed into the vials from pools which were continuously mixed during the loading process. Numerous samples of each test specimen were selected at random by the Parasitology Laboratory of the Wadsworth Center, NYSDOH, and were assayed for quality and confirmation of contents. Extensive quality control tests were also conducted by the supplying vendor and a detailed quality control report was submitted to the Parasitology Laboratory for inspection and verification. Samples were authenticated by 80% of participating laboratories and/or referee laboratories.

09-K (Helminths Only)

Correct diagnosis: *Diphyllobothrium latum*.

Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Diphyllobothrium latum</i>	125/125	100	10/10	Correct

Quality Control and Referee Information

Participating and referee laboratories agreed that *Diphyllobothrium latum* was the correct response (100%). Quality control examination of 4% of this sample showed an average of 12 ova per coverslip. Other tests performed include a Direct Immunofluorescent Assay and ELISA for *Giardia lamblia* and *Cryptosporidium* sp. which were negative for both organisms. A modified acid-fast stained smear was also negative.

Diagnostic Characteristics



Diphyllobothrium latum is an intestinal tapeworm acquired by ingesting raw or poorly cooked freshwater fish. The diagnostic stage is the egg recovered in stool. These eggs are ovoid and measure 60-70µm by 20-35µm. They have an operculum at one end and a small knob at the other. The knob may or may not be visible depending upon the position of the egg. These eggs may be confused with *Paragonimus* sp. so measurement with a calibrated ocular micrometer is important.

09-L (All Parasites)

Correct diagnosis: No Parasites Seen.

Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
No Parasites Seen	125/125	100	10/10	Correct

Quality Control and Referee Information

Participating and referee laboratories agreed that **No Parasites Seen** was the correct response (100%). Quality control wet mount examination of 4% of this sample showed no organisms present. Other tests performed include a Direct Immunofluorescent Assay and ELISA for *Giardia lamblia* and *Cryptosporidium* sp. which were negative for both organisms. A modified acid-fast stained smear was also negative.

09-M (All Parasites)

Correct diagnosis: *Strongyloides stercoralis*.

Results of Participating Laboratories

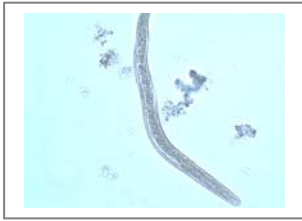
Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Strongyloides stercoralis</i>	124/125	99	10/10	Correct
<i>Necator americanus</i> / <i>Ancylostoma duodenale</i>	1	1	0	Incorrect

Quality Control and Referee Information

Participating and referee laboratories agreed that *Strongyloides stercoralis* was the correct response (99 and 100%). Quality control examination of 4% of this sample revealed an average of 15 larvae per coverslip. Other tests performed include Direct Immunofluorescent Assay and ELISA for *Giardia lamblia* and *Cryptosporidium* sp. which were negative for both organisms. A modified acid-fast stained smear was also negative.

Diagnostic Characteristics

Strongyloides stercoralis is an intestinal nematode with a very complex life cycle. Infection is acquired when filariform larvae in the soil penetrate the skin and are carried in the blood to the lungs. From the lungs they travel up the trachea and are swallowed. Once in the intestine they develop into mature female worms and begin to produce eggs by parthenogenesis. These eggs, which are rarely seen, hatch in the intestine into rhabditiform larvae. The larvae pass in the feces and develop into male and female worms in the soil where they complete their life cycle. The diagnostic stage is the rhabditiform larvae passed in the stool. They measure 180-380µm, have a short buccal cavity and a prominent genital primordium.



09-N (Protozoa Only)

Correct diagnosis: *Entamoeba coli*.

Results of Participating Laboratories

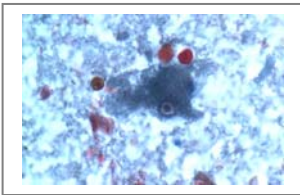
Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Entamoeba coli</i>	112/125	90	10/10	Correct
<i>Blastocystis hominis</i>	1	1	1	No Penalty
<i>Entamoeba histolytica/dispar</i>	9	7	0	No Penalty
<i>Entamoeba hartmanni</i>	1	1	0	Incorrect
<i>Chilomastix mesnili</i>	1	1	0	Incorrect
<i>Dientamoeba fragilis</i>	1	1	0	Incorrect
<i>Endolimax nana</i>	1	1	0	Incorrect
No Parasites Seen	5	4	0	Incorrect

Quality Control and Referee Information

Participating and referee laboratories agreed that *Entamoeba coli* was the correct response (90 and 100%) Quality control examination of 4% of this sample showed trophozoites and cysts in every 10-15 oil immersion fields. All cysts seen on quality control examination had 6 or greater visible nuclei and the trophozoites measured between 15 and 20µm. Nuclear chromatin is present as is a large diffuse karyosome. Rare *Blastocystis hominis* is also present as reported by 10% of referee labs and rare *Entamoeba histolytica/dispar* trophozoites as noted on quality control examination.

Diagnostic Characteristics

Entamoeba coli is distributed worldwide and is nonpathogenic. The trophozoites vary in size from 15-50 micrometers with an average range of 20-25µm. They have a single nucleus that generally has a large diffuse karyosome and irregular peripheral chromatin. The cytoplasm is generally granular and vacuolated. The cysts measure between 10-35µm with an average range of 15-25µm. The mature cyst has 8 nuclei that have uneven peripheral chromatin and large diffuse karyosomes. Chromatin bars are less common than in *Entamoeba histolytica* and have pointed ends. Infection occurs by ingesting contaminated food or water.



09-O (All Parasites)

Correct diagnosis: *Plasmodium ovale*.

Results of Participating Laboratories

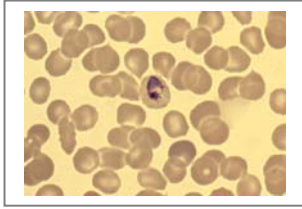
Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Plasmodium ovale</i>	57/117	49	3/10	Unauthenticated
<i>Plasmodium malariae</i>	31	26	1	No Penalty
<i>Plasmodium vivax</i>	7	6	1	No Penalty
No Parasites Seen	19	16	5	No Penalty

Quality Control and Referee Information

Participating and referee laboratories failed to agree that *Plasmodium ovale* was the correct response (49 and 30%). Quality control examination of 4% of this sample showed a low parasitemia with parasites in every 30-40 100 X oil immersion fields. The infected cells are oval and fimbriated. The parasites have compact cytoplasm, a large nucleus, and scattered coarse pigment. The only stage seen was the mature trophozoite.

Diagnostic Characteristics

Plasmodium ovale infections occur primarily in Central West Africa and some South Pacific Islands and account for fewer than 5% of all malaria cases. *P. ovale* malaria is usually less severe than other malarias and often ends in spontaneous recovery. The infected cells are usually enlarged, fimbriate, and have Schüffner's stippling. The cytoplasm of the trophozoites is usually less amoeboid than that of *P. vivax* and the schizonts have 4-12 merozoites compared to 12-24 for *P. vivax*. The chromatin is usually very pronounced and the pigment is coarse.



Scoring Information

Immunoassay Results

<i>Cryptosporidium</i>	09-K		09-L		09-M	
METHOD	-	+	-	+	-	+
Meridian ImmunoCard STAT Crypto/Giardia	21	0	21	0	21	0
Meridian Merifluor Crypto/Giardia	20	0	20	0	20	0
Remel ProspecT Cryptosporidium EIA	22	0	22	0	22	0
Remel Xpect Cryptosporidium	1	0	1	0	1	0
Remel Xpect Giardia/Cryptosporidium	4	0	4	0	4	0
TechLab/Wampole Test EIA	6	0	5	1	5	1

<i>Giardia</i>	09-K		09-L		09-M	
METHOD	-	+	-	+	-	+
Meridian ImmunoCard STAT Crypto/Giardia	22	0	22	0	22	0
Meridian Merifluor Crypto/Giardia	15	0	15	0	15	0
Remel ProspecT Giardia EIA	28	0	28	0	28	0
Remel ProSpect Giardia EZ	2	0	2	0	2	0
Remel Xpect Giardia	3	0	3	0	3	0
Remel Xpect Giardia/Cryptosporidium	4	0	4	0	4	0
TechLab/Wampole Test EIA	9	0	8	1	8	1

Distribution of Scores

Score	# of labs	% of labs
100	121	89
90-99	1	1
80-89	11	8
70-79	1	1
60-69	1	1

Answer Key

Sample	Correct Answer	Points
09-K	<i>Diphyllobothrium latum</i>	20
09-L	No Parasites Seen	20
09-M	<i>Strongyloides stercoralis</i>	20
09-N	<i>Entamoeba coli</i>	20
09-O	<i>Plasmodium ovale*</i>	20

TOTAL POSSIBLE POINTS 100

*Unauthenticated-all answers accepted.

Grading

The answer key was derived from the response of all participating laboratories as per **CLIA Regulations**, Part 493, Subpart I, Section 493.917. These regulations can be viewed at www.phppo.cdc.gov. These regulations state that 80% or more of participating laboratories **or** referee laboratories must identify the parasite for it to be correct. Similarly, reporting of a parasite identified by less than 10% of the participating laboratories **or** referees finding parasites or ova is an incorrect response. Organisms reported by more than 10% but less than 80% of the participating laboratories **or** referees are "Unauthenticated", and are not considered for grading.

Each sample has a maximum value of 20 points. Credit is given according to the formula:

$$\frac{\text{Number of correct responses by lab}}{\text{\# Correct Parasites Present} + \text{\# Lab's Incorrect Answers}} \times 100$$

Important Reminders

The mailout dates for Parasitology have been changed from the first Monday to the first Tuesday of February, June, and October.

The next Parasitology Proficiency Test is scheduled for **February 2, 2010**. You are responsible for notifying us **before February 16, 2010** if you do not receive your test. Proficiency test results must be electronically submitted through EPTRS by **February 9, 2010** or you will receive a zero. These requirements are clearly stated in your NYS Proficiency Testing Handbook provided by the NYS Clinical Laboratory Evaluation Program or can be accessed via the Internet at:
<http://www.wadsworth.org/labcert/clep/ProgramGuide/WebGuide.pdf>

News and Notes

Beginning with the February 2009 proficiency exam, the **grading policy changed**. In order to make the score on the NYS Parasitology PT exam more accurately reflect laboratory performance, and be more consistent across categories, a new scoring system is in effect. Under the new scoring system, grades will be based only on the specimen types processed by your laboratory. For example, if your laboratory does not process blood smears, your score will be based on the four fecal specimens, each of which will be worth 25% of the total. Laboratories that process all of the types of samples included in the exam will not observe any changes in scoring method.